

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	
Inquiry Concerning the Deployment of)	
Advanced Telecommunications)	
Capability to All Americans in a Reasonable)	GN Docket No. 04-54
And Timely Fashion, and Possible Steps)	
to Accelerate such Deployment)	
Pursuant to Section 706 of the)	
Telecommunications Act of 1996)	

COMMENTS

The National Exchange Carrier Association, Inc. (NECA) submits these comments in response to the Commission's *Notice of Inquiry* in the above-captioned proceeding.¹ This is the Commission's fourth inquiry into the status of nationwide deployment of advanced telecommunications capability. The Commission seeks comment on various market, investment and technological trends in assessing whether advanced services are being made available to all Americans in a reasonable and timely manner.²

NECA's pool members operate in sparsely populated areas of the country and continue to face widely varying geographic, demographic, and technological challenges when deploying advanced telecommunications. NECA has filed comments addressing rural carrier challenges in

¹ See Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, CC Docket 98-146, *Notice of Inquiry*, 19 FCC Rcd 5136 (2004) (*Notice of Inquiry*).

² *Notice of Inquiry* at ¶ 1.

the past³ and, since 1989, has conducted biennial surveys of the technical capabilities of small rural carriers that participate in NECA's Traffic Sensitive (TS) tariff, publishing this information as the NECA Access Market Survey.

NECA's 2003 Access Market Survey⁴ shows that over half of the surveyed companies serve areas greater than 200 square miles, often from a single switch. These companies typically serve fewer than 10 customers per square mile and require extensive cable and transmission equipment to provide even basic services.⁵ In addition, many rural carriers have deployed repeaters, load coils, and line concentrators to accommodate their voice networks to geographic conditions. However, these voice-compatible technologies may severely limit the bandwidth needed for today's high-speed advanced telecommunications.

Despite vast loop lengths and technical hurdles, NECA member companies continue to roll out DSL at an impressive rate, utilizing a variety of new products that are specifically geared toward loop carrier remote terminals. As the *Notice of Inquiry* notes, 78.95% of NECA member

³ See NECA *Comments*, CC Docket No. 98-146 (Mar. 20, 2000); NECA *Comments*, CC Docket No. 98-146 (Sept. 24, 2001).

⁴ NECA's Access Market Survey- Fulfilling the Digital Dream (*AMS*) at 4-5 (Attachment). NECA has in the past also published studies that investigated the cost of providing broadband capability using digital subscriber line (DSL) technology to customers served by these rural telephone companies. The "last mile" study, published in June 2000, found that while many rural telephone companies were making broadband services available to their customers, others faced significant cost hurdles due to the nature of the rural serving areas. See Letter from Regina McNeil, NECA to Magalie Roman Salas, FCC, CC Docket No. 99-301 (June 21, 2000), attaching the "last mile" study. Results of this study estimated the cost of upgrading 3.3 million rural lines to broadband capability to be almost \$10.9 billion. A "middle mile" study published in November 2001 focused on the high cost of transporting Internet traffic from a rural telephone company's serving area to an Internet Backbone Provider. NECA's Middle Mile Broadband Cost Study, 2001. The study can be found at: http://www.neca.org/source/NECA_155_1154.asp

⁵ *AMS* at 5.

companies' access lines now are equipped to provide DSL services.⁶ This represents a steady increase in the availability of DSL to rural customers over prior surveys.⁷

A key factor underlying the rural deployment of DSL transmission service is the ability of Rate of Return (RoR) companies to tariff DSL services. It is likely that a number of NECA TS pool members would not be able to offer broadband DSL without the regulatory and economic assurances provided by the tariff and pooling process.⁸ Tariff participants are spared the task of developing, filing and defending their own tariffs, thus saving time and money. In addition, revenue pools offer stable monthly cash flows and reduce the risks incurred when a carrier deploys new technologies.⁹

⁶ *Notice of Inquiry* at ¶ 31.

⁷ In the 2001 Access Market Survey, 557 member companies already deployed DSL and 66 were planning to deploy DSL. In the 2003 Access Market Survey, 814 member companies were reported to have already deployed DSL- a 46% increase in 2 years. In the 1999 Access Market Survey, only 151 member companies were reported to have implemented DSL, with 93 planning on implementation.

⁸ See Letter from Richard A. Askoff, NECA to Marlene H. Dortch, FCC, CC Docket No. 02-33 (Nov. 20, 2003), stating that it is essential that small carriers continue to have the option of offering broadband services via the NECA tariff.

Despite both geographic and technological challenges faced by small, rural LECs in deploying advanced telecommunications service, NECA member companies are making steady progress in deploying advanced services in rural areas.

Respectfully submitted,

NATIONAL EXCHANGE
CARRIER ASSOCIATION, Inc.

By: /s/ Richard A. Askoff
Richard A. Askoff
Its Attorney

May 10, 2004

80 South Jefferson Road
Whippany, NJ 07981
(973) 884-8000

⁹ NECA's 12 month DSL rate for 1.544 Mbps/512 Kbps speed is \$30.95. This compares favorably with rates for similar services offered by larger carriers.

CERTIFICATE OF SERVICE

I hereby certify that a copy of the NECA's Comments was served this 10th day of May 2004, by electronic filing and first class mail, to the persons listed below.

By: /s/ Elizabeth R. Newson
Elizabeth R. Newson

The following parties were served:

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554
(via ECFS)

Qualex International
Room CY-B402
445 12th Street, S.W.
Washington, DC 20554

Attachment

Fulfilling the Digital Dream

**A report on the technology of
small and rural telephone companies**



2003 Access Market Survey

**NECA's
2003 Access Market Survey**

**Fulfilling the Digital Dream:
A report on technology deployment
at rural telephone companies**

**Prepared by NECA's
Technology Planning
and Implementation Group**

Ronald Dibelka, Project Manager

Copyright 2003

INTRODUCTION

NECA's Access Market Survey is a biennial look at technology deployment at more than 1,000 small, mostly rural local telephone companies. The 2003 survey illustrates how these companies are keeping pace with the telecommunications marketplace, furthering the goal of deploying advanced telecommunications services at reasonable rates. Through the unique industry database we've built from seven previous surveys, we've tracked members' technological progress since 1989.

Data aids in tariff development

NECA conducts this survey to gather information about the technical capabilities of the small, mostly rural telephone companies that participate in its Traffic Sensitive (TS) tariff. Having this data readily available allows us to respond to members' requests for new service tariffs or enhancements to existing interstate tariff offerings. Current and past survey data is maintained in a database that is populated from additional sources, including NECA's interstate access tariff, its wire center tariff and settlement systems

Great strides made

Survey results show significant progress in rural telco efforts to build advanced telecommunications networks. For example, 814 Traffic Sensitive pool members provide digital subscriber line (DSL) access services, up from 557 in 2001, a 46 percent jump. You'll read more in the following pages about the characteristics of rural markets and the status of technology deployment.

The dream – 40 years in the making

It's difficult to pinpoint the onset of the digital revolution, but many consider these as key events:

- 1962: Deployment of the first digital carrier facility.
- 1965: The first electronic switching system, the precursor to digital switches, is deployed.
- 1975: First digital connection by three rural independent telcos to a toll switch.

When we conducted our first Access Market Survey in 1989, 65 percent of pool members' switches were digital. By 1999, virtually all network facilities and switches were digital, allowing for new technologies such as Frame Relay, Asynchronous Transfer Mode (ATM), SONET and DSL to make inroads in rural America.

Our role in rural technology

NECA plays a critical role in rural broadband deployment. Through research efforts such as this study, we continually update the tariff to include the latest service arrangements and technologies. Tariff participants are spared the task of developing, filing and defending their own tariffs, thus saving time and money. Related revenue pools offer stable monthly cash flows and buffer members against unexpected demand reductions or increased costs caused by bankruptcies, natural disasters or loss of a large customer. The security that pooling offers also reduces the risks incurred when a carrier deploys a new technology.

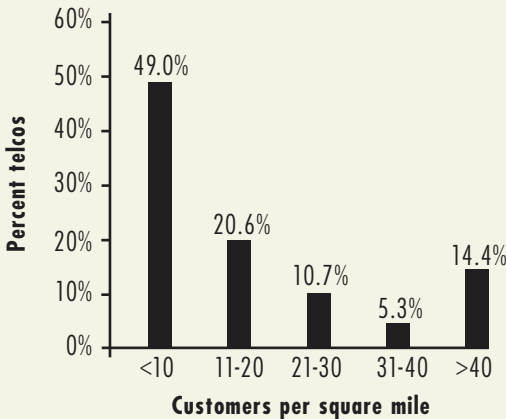
In addition to tariff development, we monitor regulatory actions that affect rural telcos' ability to offer broadband services. For example, as we go to press, the Federal Communications Commission has proposed that advanced services be classified as deregulated information services, exempting them from tariffing. We've told the Commission that regardless of its final decision, NECA members should continue to have the option to offer broadband transmission services through our tariff.

CHARACTERISTICS OF RURAL MARKETS

This section describes characteristics of the more than 1,100 rural carriers that belong to NECA's Traffic Sensitive pool. Pool membership has remained largely stable over the years. While line growth has been declining nationally, pool access lines grew by 45,000 since the 2001 survey.

The surveyed companies generally serve sparse populations over wide geographical areas and do not enjoy the economies of scale afforded to their large, non-rural counterparts. Almost half serve fewer than 10 customers per square mile (See Figure 1). By contrast, larger, non-rural carriers often serve thousands of customers per square mile.

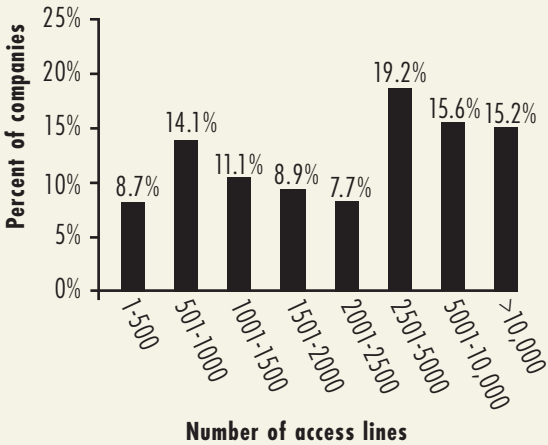
Figure 1 – customer density per square mile



The companies have installed 5,412 central office switches to handle the voice communications of approximately seven million business and residential customers, an average of 1,265 customers per switch. While the average company uses nearly five switches, 35 percent use only one. Less than 10 percent use more than 10 switches in their serving area. These averages have varied little since the 1991 survey. Likewise, rural companies' customer bases are

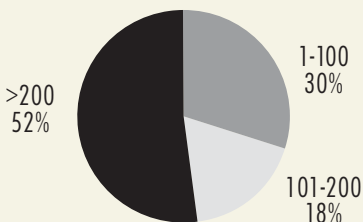
extremely small, averaging only 6,119 lines per company. Half the companies serve 2,500 lines or less. (See Figure 2.)

Figure 2 – distribution of companies by line size



Roughly half the surveyed companies serve areas greater than 200 square miles (See Figure 3). This requires extensive cable and additional transmission equipment, which drives up the cost of service. Additionally, the equipment needed in these areas to provide quality voice transmission, such as repeaters, load coils, line concentrator and loop carrier systems, severely limits the bandwidth needed for high-speed, advanced communications. Carriers must make further accommodations for this equipment to allow for technologies such as DSL to work over these lines.

Figure 3 – Distribution of companies by serving area

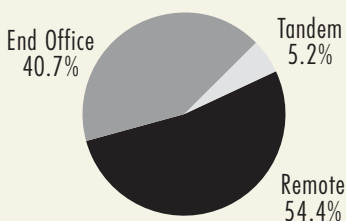


Voice network enhancements continue

In spite of the challenges of serving small customer bases over vast geographical areas, NECA's members continue to improve their networks to provide customers with state-of-the-art voice services in a cost-efficient way. Many companies do this by using remote switches. They draw the features and functionalities needed to offer advanced voice-calling features such as Caller ID from a larger host switch, making the remotes less costly. Remote switches constitute more than half the switches used.

(See Figure 4.)

Figure 4 – Switch function



Old favorites found still useful

While rural telcos offer the latest services and technologies, some older technology survives, due to regulatory requirements. Eighty-four surveyed telcos report that they still offer party line service. In states where public service commissions have grandfathered party line service, telcos can't discontinue the service as long as customers continue to want it. Some customers still prefer this antiquated but economical alternative.

Rural market statistics by state are in the chart at the end of this brochure.

TODAY'S TECHNOLOGIES IN RURAL AMERICA

This section describes broadband technologies rural telcos currently use. The efficiencies these technologies create benefit rural telcos and their customers. Packet switching equipment and protocols, as described below, make the best use of the network by converging voice and data and routing it onto one network. Cost savings are realized because less equipment is required and the equipment is less expensive. For example, today's software-driven "softswitches," are less costly to buy and maintain. This computerization of work processes also increases telco employees' productivity. The efficiencies of time and cost that telcos gain are passed on to customers in the form of more services at lower rates.

Cell and Packet Technology

Cell and packet technologies that are essential to advanced services have evolved over the past 40 years. In the 1960s, X.25 Packet Switching was the leading communications technology for the analog world. A decade later, Ethernet was developed and today is the most widely-installed local area network technology for business and residential computer applications. Ethernet is the de facto computer industry standard and is quickly moving into the telecommunications network. Other technologies such as Integrated Services Digital Network (ISDN), Frame Relay, ATM, DSL and Internet Protocol (IP) have also contributed to the digital revolution. The technologies most used by NECA members are described below.

DSL use is booming

DSL technology delivers low-cost, high-speed network access that supports many advanced communications capabilities. DSL works on regular phone lines and is capable of transmitting voice, data and video traffic at speeds of more than 26 Mbps (megabits per second). In some applications, a customer's existing telephone service can carry voice telephone calls and high-speed data and video communications simultaneously. This capability is

transforming the rural public voice network into a broadband network capable of handling virtually all modes of telecommunications.

NECA's tariff offers many "flavors" of DSL to adapt to the varying needs of our telcos' customers. From the basic Asynchronous DSL (ADSL) service to the recently introduced high-speed service that provides transport for multimedia content such as games and videos, members are embracing this technology (see Figure 5).

Figure 5 – DSL Deployment

2001 Survey		2003 Survey	Increase	
Companies currently deploying	Companies planning to deploy	Companies currently deploying	Number of companies	%
557	66	798	241	43%

Frame Relay speeds data transport

Frame Relay service uses "virtual circuit" and packet switching technology to provide cost-effective data connections. Frame relay networks are ideal for data traffic, which is "bursty" in nature, has limited need for additional service quality parameters, and relies on higher-level protocols for error detection and correction. Frame relay allows for packet switching and virtual circuit technology to share network transport resources such as bandwidth among telco customers.

ATM helps telcos compete

ATM is a high-performance packet switching and multiplexing technology that integrates voice, data and video services. ATM technology is widely associated with IP-based networks and is replacing circuit switched transport services in public and private networks. It is the leading technology integrating DSL services within the local exchange, and is widely deployed in local and long distance markets. Using ATM technology in the public network allows rural telcos to offer their customers access to services

on par with those in urban areas, allowing them to compete for businesses that might otherwise stay in or relocate to larger population areas.

Affiliated operations: wireless, video, and data

In addition to these core services offered through NECA's interstate access tariff, members are offering non-regulated services directly or via affiliates to serve customers better and to address increasing competition. By maximizing the use of their facilities, telcos gain more revenues, further reducing their costs. Non-regulated services include the transport of wireless, video and data traffic. Some examples are:

Commercial Mobile Radio Service (CMRS).

Telephone companies in most areas are facing substantial competition for voice services from CMRS licensees, which includes cellular, personal communications service (PCS) and paging services. Pursuant to FCC regulations, up to eight CMRS operators are licensed in the geographic serving areas of the more than 1200 NECA Common Line Pool members. While not all licensees currently provide these services, the potential for significant competition clearly exists. About one-third of the members provide CMRS themselves or resell the service (75 as PCS and 282 as cellular service).

Video Services. Ten companies report providing wireless video services using the Multi-channel Multi-point Data Service (MMDS) and the Local Multipoint Distribution Service (LMDS). 314 companies have cable television (CATV) operations providing video services to their customers. Of these, 26 are also providing broadband cable modem service. 56 companies provide CATV services outside their serving area. Direct Broadcast Satellite (DBS) services are offered to customers in the serving area of 127 companies.

Information Service Provider (ISP) services.

Information access services to the Internet are provided by 749 affiliates within their own serving areas and 115 also provide ISP services in other serving areas. Thirty-six companies reported using unlicensed spectrum to provide data services to customers. With the rapid growth of WiFi we expect this number to increase dramatically.

IN SUMMARY

The latest survey shows technology advances among rural telcos are greater than expected. For example, the 2001 survey reported that 66 companies planned to deploy DSL services in the following two years. 2003 survey results show that 257 companies added one or more DSL services in that time period. Seventy companies have added ATM (60 % more than 2001), which delivers DSL signals, in their networks. This is a 65 % increase over 2001.

For the rural company, the primary stimuli to deploy new capabilities are customer demand for these services and an economic framework that recovers deployment costs. Rural telcos are meeting growing customer demand for advanced services in spite of the hurdles they must overcome. NECA continues to work for and with our members to make it easier for them to offer their customers the same advanced services as customers in non-rural areas and at comparable rates.

ABOUT NECA

NECA is a non-stock corporation in which all incumbent local telephone companies, or exchange carriers, are members, as mandated by rules of the Federal Communications Commission. Formed in 1983 to administer the FCC's access charge plan following the breakup of AT&T and the Bell System, we provide a wide range of services to the telecommunications industry. Our staff consists largely of professionals expert in telecommunications regulation, the administration of complex public policy programs and the collection, analysis and forecasting of industry data. We're based in northern New Jersey and operate regional offices in Atlanta, Chicago, St. Louis, Omaha, Denver, and Concord, California. Our government relations group is located in Washington, D.C.

GLOSSARY

Asynchronous Transfer Mode (ATM) – A communications technology that allows for high-speed transmission of voice, video and data over one common network infrastructure. ATM processes information in fixed length data cells, minimizing transmission delays. ATM customers are typically information service providers who need ATM's large, high-speed capacities.

Digital Subscriber Line (DSL) – Technology that brings high-bandwidth information services to the home or small business over regular copper lines. It works by splitting the line to carry voice, which takes little bandwidth, and data simultaneously over the same line. NECA offers DSL access services in its interstate access tariff so that carriers may offer the technology to their customers.

Ethernet – A local area network technology that connects computers, printers, servers, etc., in a physical location such as a building. Ethernet uses twisted pair (copper) and coaxial cable and is also used in wireless LANs.

Frame Relay – Telecommunications service designed to transmit data cost-effectively between local area networks (LANs) when traffic is intermittent. For most services, a permanent virtual circuit provides a continuous dedicated connection without having to pay for a full-time leased line. Frame relay is a mid-range service with speeds faster than ISDN, but slower than ATM.

Internet Protocol (IP) – The method by which data is sent from one computer to another. Every computer using the Internet is uniquely identified by at least one IP address.

Synchronous Optical Network (SONET) – Fiber optic technology capable of transmitting digital signals with different capacities. SONET provides an international standard for manufacturers. Ideally, it is configured in a physical ring for redundancy purposes.

Status of Selected Network Capabilities of

Jurisdiction	Companies	Offices	Access Lines	Central Offices
Alabama	21	82	121,879	71
Alaska	23	320	265,386	284
Arizona	13	54	38,936	35
Arkansas	23	209	335,160	186
California	14	46	85,122	32
Colorado	25	53	49,277	42
Connecticut	1	2	25,844	2
Florida	6	25	81,589	25
Georgia	28	109	326,852	68
Guam	1	18	66,251	-
Hawaii	1	9	954	9
Idaho	15	65	45,401	40
Illinois	19	55	30,035	46
Indiana	34	81	131,910	62
Iowa	143	332	210,561	283
Kansas	33	202	115,152	173
Kentucky	14	95	173,593	76
Louisiana	18	100	152,711	91
Maine	22	120	150,291	83
Maryland	1	1	7,781	1
Massachusetts	2	2	4,173	2
Michigan	32	100	110,595	65
Minnesota	76	319	315,243	215
Mississippi	15	59	75,882	30
Missouri	34	287	227,463	260
Montana	15	212	97,789	186
Nebraska	36	146	73,961	114
Nevada	7	30	32,154	17
New Hampshire	7	22	41,006	20
New Mexico	12	78	44,688	62
New York	29	80	158,945	55
North Carolina	16	63	290,110	55
North Dakota	27	246	156,277	216
Ohio	31	66	201,971	34
Oklahoma	34	276	204,626	137
Oregon	26	55	75,661	46
Pennsylvania	19	128	570,664	45
South Carolina	14	56	135,064	46
South Dakota	25	173	111,401	135
Tennessee	20	129	335,877	88
Texas	48	335	274,835	249
Utah	12	57	70,772	57
Vermont	9	45	64,780	29
Virginia	15	49	80,697	36
Washington	17	45	86,615	32
West Virginia	6	13	16,464	8
Wisconsin	74	336	549,897	267
Wyoming	6	27	25,072	25
TOTALS	1119	5412	6,847,367	4,140

"Percent of Companies" indicates that the service is available at those companies, not that all customers at each of those companies subscribe to that service.

2003 Access Market Survey Respondents

Equiped for DSL			% Companies Equiped with ATM	Central Offices Equiped for Equal Access*
Switches	Companies	Access Lines		
86.59%	71.43%	86.13%	19.05%	98.78%
88.75%	73.91%	95.19%	8.70%	42.81%
64.81%	53.85%	71.56%	7.69%	100.00%
89.00%	78.26%	94.06%	43.48%	99.52%
69.57%	64.29%	76.44%	7.14%	93.48%
79.25%	76.00%	92.67%	8.00%	98.11%
100.00%	100.00%	100.00%	0.00%	100.00%
100.00%	100.00%	100.00%	0.00%	52.00%
62.39%	67.86%	70.38%	7.14%	95.41%
0.00%	0.00%	0.00%	0.00%	100.00%
100.00%	100.00%	100.00%	0.00%	100.00%
61.54%	60.00%	62.96%	20.00%	100.00%
83.64%	57.89%	74.17%	0.00%	98.18%
76.54%	76.47%	76.37%	17.65%	100.00%
85.24%	78.32%	84.92%	6.99%	95.18%
85.64%	81.82%	93.45%	18.18%	99.01%
80.00%	78.57%	74.29%	21.43%	96.84%
91.00%	83.33%	90.74%	61.11%	99.00%
69.17%	63.64%	64.86%	13.64%	99.17%
100.00%	100.00%	100.00%	0.00%	100.00%
100.00%	100.00%	100.00%	0.00%	100.00%
65.00%	71.88%	81.68%	18.75%	97.00%
67.40%	61.84%	75.43%	10.53%	99.69%
50.85%	53.33%	64.08%	13.33%	93.22%
90.59%	67.65%	90.95%	17.65%	97.56%
87.74%	93.33%	79.84%	13.33%	89.62%
78.08%	75.00%	75.78%	5.56%	100.00%
56.67%	57.14%	81.58%	28.57%	86.67%
90.91%	71.43%	96.52%	28.57%	95.45%
79.49%	58.33%	81.97%	25.00%	98.72%
68.75%	72.41%	67.29%	24.14%	98.75%
87.30%	68.75%	91.74%	37.50%	95.24%
87.80%	70.37%	91.74%	33.33%	99.19%
51.52%	77.42%	28.20%	0.00%	100.00%
49.64%	61.76%	57.71%	11.76%	99.28%
83.64%	88.46%	97.54%	0.00%	100.00%
35.16%	84.21%	41.34%	15.79%	100.00%
82.14%	85.71%	86.63%	28.57%	100.00%
78.03%	84.00%	81.17%	20.00%	99.42%
68.22%	75.00%	75.40%	50.00%	96.12%
74.33%	70.83%	77.92%	16.67%	98.21%
100.00%	100.00%	100.00%	0.00%	100.00%
64.44%	77.78%	66.00%	55.56%	100.00%
73.47%	66.67%	73.45%	6.67%	97.96%
71.11%	70.59%	78.05%	11.76%	100.00%
61.54%	50.00%	67.12%	0.00%	100.00%
79.46%	68.92%	85.60%	27.03%	100.00%
92.59%	66.67%	86.72%	0.00%	96.30%
76.02%	73.23%	78.95%	15.84%	95.96%

*Equal access gives customers a choice of long distance carrier. Although not a new service, NECA continues to track progress toward the goal of 100% equal access capability.

**For further information about NECA,
visit our website at www.neca.org or contact:**

**Director - Corporate Communications
NECA**

**80 South Jefferson Road, Whippany, NJ 07981
Tel: 973-884-8207 Fax: 973-884-8484**

**For additional copies call 800-228-8597, X8142
or e-mail rdibelk@neca.org**